

Group Interview 3

JS: We were never going to write anything, and then Wayne and others would always ask you things, and it would be very late, and yet the irony on the continuum was when we were really scrambling to get it done at the last minute, I kept the files all organized, and the pieces of the puzzle. But in the nineties, I said, boys, see I have another project, we walked out in the street, and I got run over by someone coming out of a fast food outlet, trying to get on a real fast-moving street, like Cannon or something. And I woke up, in the middle of this four-lane road, and I asked two questions. One was, "Where are my glasses?" I whined about the glasses. And the other one was, "What side of my head got hit" And the left rear got hit. And what I was asking about was, we had taken these Sherman brain dominant tests to see if the right front was the creative part, and then the right rear was more spiritual. And then this one back here was organization and administration management. And then nothing showed up on that test. So I said, "Great! There was nothing to hurt!" There was nothing there to begin with, and so I felt like I really dodged a bullet, in what could have been a very serious accident.

1:31

KC: But in the end the overdominance of this creative and . . .

JS: So I moved on.

KC: So this follows up with the carrying through from the early

JS: It explains a lot.

VR: So we're talking about communications, and what we want to try to do is get into this question of what made this program—this project—so incredibly successful. Ken is one place. You're in Oregon. Wayne is in Idaho. You're three thousand miles away in Pennsylvania. You're up in "Nuclide" City, and Jim is moving around all over. Robin has said that there was very little money to bring people together for regular planning meetings. How did you guys work on papers—twenty-one to thirty-three papers? How did you keep consistent about what methods you were going to use. How did you logistically handle a project this big, spread out so far without emails, without faxes. What was the key to the success?

2:53

WM: Well, since we keep coming back to this you have to think of other things, but in part, we were somewhat independent. We could handle a lot of this ourselves. I mean, as I said, in our first year, when we were working on individual sites, there was a lot you just had to do. And there wasn't a need for communication at that point. The data gathering point. Other than that you're on task, and that you're doing the same things,

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JS: And you agreed on what you were going to measure and how you were going to measure it.

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WM: Yeah. But not a lot of communication. And I'm thinking there were phone calls. Yeah, but I didn't call Ken a lot. Maybe Jim Brock Called somebody at his shop to talk to him. I might have talked to the Stroud area, especially the Peterson lot, or to Bert, since we were doing a lot of things collaboratively, but other than that, initially, there was not a lot. I mean, I had Peterson on the phone a lot, but—

3:43

JS: But that was after we got established. But the lead-up to that beforehand, there was a lot of communication. There were a lot of one-on-one meetings. There were a lot of four or five meetings. And all of those developed a relationship, and I think a trust building that allowed some things to keep going even with huge differences with styles and personalities.

4:11

WM: I'm separating in my mind the communication went on in the preparation of the proposal, and what led up to the pubs and then how those were facilitated. And usually, even now, how pupsb are done, there's a leader. Some senior author. And we did some assignments, for example. You're going to take charge of this, and you're going to work with that. And we might have varied from that some, but basically, there was a lead person who maybe prepared the initial manuscript, was on the phone to those two or three people, was using the mail extensively to exchange information. And then you might even hammer out with somebody showing up at your place, like Bob did often, or in a workshop at a meeting, we'd set aside some time at a meeting there. So in the normal mode of transportation, some of those things could be brought together. And then just mailing the manuscript back and forth rather than emailing it. There's no other way.

5:11

RV: I think we had built into the grant one or two meetings at somebody's shop a year. And that was built in. But other than that, it was professional meetings and the telephone. Bob did most of his coordinating of data sets.

5:34

KC: And he's the one we talked to when we wanted to know—

JS: And then he would come around to look through our data sets.

KC: So he probably did more traveling, actually—

JC: In the mid to later stuff.

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WM: And much of what Ken was saying earlier about the email and so on. A good part of that's very divisive. Very time consuming, divisive in the sense of a distraction from your main chores, and from the need of being in the field, gathering the data, and getting into data forms and so on. You can be too efficient, you know. You get eaten up by it. That's number one. And number two, I've been thinking about it a little bit. There's some advantage in having things digested, whether you write them out, or type them out and send them by mail, or talk them over and clarify them in conversation. What you can't do when you blast off an email, and then wish I'd have said that a little differently or more explicitly or whatever.

6:35

BC: I can remember editing manuscripts over the phone. Not by computer tracing and all this stuff, and tracking, but just sitting there, you call Wayne up. Let's set an hour aside. We'd go through the manuscript.

6:53

JS: But I guess it goes back, also in terms of when you read something, you just don't get a feel for it. I don't. And then when you listen you don't. I like to see while I'm hearing, and so the personal, well you could read things, you could see when people were uncomfortable, you could figure a way around it or hit it head-on or whatnot. It was a lot more complete. So to me the gathering is really the most important of how things—

7:25

KC: I don't remember a lot of conference calls. Did we do conference calls?

RV: Yeah, there were a couple of calls.

KC: And when we were proposal writing. I can remember those. But manuscript stuff?

JS: I think we were trying to decide, what data to include at one time. I remember two of them where Peterson had put them together. And we were trying to coordinate what we needed to get in.

RV: I think the most productive times were when we had workshops where we all gathered and divided up assignments, whether it was a main job, or temping, or—

WM: Not only productive, but just intellectually stimulating. I mean, they were real turn-ons.

8:01

VR: Did you involve your students and people that were not directly related in these discussions.

RV: I feel like the Oregon State students were always there.

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JS: And you had a lot of the Kellogg folks there, too.

BC: There were a couple of student-related things that I think really stood out. And that was—it didn't involve all groups, but that was the time we went over to Flathead Lake, and there was a bunch of students, and then we went down the Malheur.

8:29

WM: And those were not continuum-related at all. Those were very productive, but they certainly weren't part of it, and most of them might have been—

BC: No, but they were to the fact that a lot of people learned what we were doing, and the students got to compare notes from the different places.

KC: It was an OSU-ISU Kind of—

WM: Yeah, I remember that meeting in southern Oregon. But there were some of those. And the other was, I think particularly at ISU, we were stat challenged. You know, we just didn't have a lot of senior personnel. So by the very nature of it, I involved my students very integrally, and Jim Brock In particular played a very significant role in his intellectual contributions, that way.

VR: Do you think a project like the river continuum is good for training students. Is there a tendency to have a student be just a cog in a wheel, that they don't see the whole picture. Was that ever the case, you think, for the students involved?

9:34

RV: I feel the students that were involved, some of them have become pretty prominent in rivers.

WM: I had a couple that I had in research assistantships. They thought it was just a discrete little thing. They put in their time, and they got their assistantship and that was it, and I expected them to live and breathe it and to become involved in it, and I moved away from RA's after that in my program, basically. And those two students didn't really amount to a whole lot in the end. And there were others who just sort of picked it up and lived and breathed it. They may have done it as the job, and their thesis was independent of it. And others used part of the data as their thesis. It was, oh, very very much. But I think it's sort of like NABS in a way. We all involved the students pretty integrally. It's just that in some shops, there's a more close association with the university operations than others. And Oregon and Michigan and Idaho may be closer and difficult for Bert, and less easily done at the Stroud lab, where they had a whole staff of

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JS: And you had both University of Pennsylvania and University of Delaware.

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WM: Right. Plus his crew came out to Idaho. So there were all these young kids with lots of ideas and energy even though they might not have been tied so tight to a university.

RV: I guess Dave and Allen were...came and spent a couple years in Idaho.

VR: This is going to sound so new-age saying this, but I remember as a student, a new researcher, seeing you guys, about how close you are, and how there was this feeling of bonding. I mean, you gave this impression that you were all in this together.

11:37

BC: Complete façade.

VR: Very effective, though.

WM: I don't know that there was any acting involved in it. We respected each other, and each person had a credibility of their own, and they brought something else to the table. So we were sort of dependent on each other. Where one idea might spark and go one way, and someone else could pick it up, or just carry the heavy lifting, and another part—

12:08

RV: I think we were stream ecologists, but we were all our own personalities, and although personalities shift, the common thread is the terrific interest in understanding the ecology of streams, and the interaction of streams with landscapes. So that's really the binding part, and I think that creates the friendships.

WM: Competition occurs when funding is limited. When everybody's out after the same pie. Well in this case, we had the pie. And so we didn't have to fight over that. We didn't have to undercut somebody in the process. We just go on and do the science and be very open and sharing with the—

12:53

KC: I think we believed that we were a team.

JS: Oh, yeah. And we had fun. I mean, we laughed a lot. Sometimes at Bert's expense.

KC: I think the proof of that is that whenever we got attacked from outside, we would circle the wagons immediately. It was pretty clear that there was a mutual kind of thing going on. And at least in my lab, I know that all the students over there whether they were working on the continuum project or not got involved. Because that was the main thread that was going through, and so they were just kind of—Like Milt Ward. He was never really in the continuum, but everything he did every day was somehow related because he got captured into all this stuff. Got dragged out to the field to do things.

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VR: I think one of the things you said too was that all of you were already established in what you were doing. There was no—

JS: I wasn't.

VR: Well, okay then.

WM: I suppose all of us were pretty good, but, uh—

JS: I was riding the shoulders of giants, here.

VR: So four out of five isn't bad.

BC: Watch your generalizations.

VR: There's a lot of allusions to what happened at these gatherings besides writing proposals and writing papers. Are there any anecdotes that you want to leave for history, of things that happened, whether it be Frisbee football, or shooting left-handed baskets, or—

14:37

KC: We were pretty focused on doing some other things. Otherwise we'd go nuts, you know. Like when we were out with Robin, we'd go out to the mushroom farm to see what they really did when you put them in the dark, feed them horse shit, and—

BC: They came back and applied it.

KC: Well, I mean, we did a lot of fun things.

WM: I remember we all discovered the river continuum had been written by hobbits.

KC: No, I—frisbee football was certainly true.

BC: We could spend a whole session on that, really. And we did have a good time. And when we needed to relax we relaxed and we could always come up with High points and low points.

15:22

JS: There was everything, from wrestling matches, ballgames, to a lot of horseshoes at times.

KC: A lot of the stuff when we get together, we'd do an experiment, it'd be like around the clock. Because we would be driven by Brock. And so part of the time you're just so tired, you can hardly stand up. You've got that slide of everybody lying around, sort of dead on the couch that's from working on twenty-four hours of...

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JS: George Leinhempher putting up with the camera. And he's the only one standing in the—on the ground with the, uh

KC:... knocked everybody off and killed them . . . And the other guy was George Lincoln He was certainly involved.

RV: There was also a terrific amount of pleasure in actually just doing the work. I think going into the middle fork of the Salmon river. That was just very pleasurable even though it was strenuous and we did a lot of work, spent a lot of time. You know, it was something new for many of us. Yes, I think that the total experience of doing the research just gave you a lot of enthusiasm and pleasure. Because you were always learning new things. I never knew how fast and efficient insects were of climbing over the top of the rock in, water going two meters a second. It was just unreal. And how the bottoms of these crystal-clear streams, you can see so much as opposed to more turbulent eastern streams are. There was just pleasure in doing the work.

17:13

WM: We did some of our first snorkeling as a group on the east fork of the Salmon river. And I remember going up there. And I was sort of standing on the bank where Robin and a couple others were scooting around, and Robin got so excited, he started talking under water. And he came up sputtering, "You know, you should just see all the stuff down here."

17:32

RV: Mid March at the bottom of the Salmon River, not necessarily time to get your jollies, but in any case . . .

WM: We did a couple of field trips while we were working together on the Salmon. I remember one going down to the lower Salmon, down to where the middle fork comes in, and back. And just a lot of sparks going, you know. So we were taking ideas, and they were just trying to classify the stream, how would you classify that, what we would call it, sort of terminology, definitions and so on. It's just a lot of ideas in that short trip of a couple hours. In another case, I remember going up the substream on the east fork, I believe it was. And I really think that Robin and Jim in particular, and probably Ken too, were thinking broader than I was at the time. But they were looking at this beaver influence. Which I really think audibly spun out in what Bob Naiman did and where Bob put in a lot of his work. Those ideas were really from these folks on one of the little field trips. Since we didn't get subsequent funding after that, we never pursued that at all.

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BC: Five years of work, these kinds of things can go on for days, these kinds of little highlights, lowlights. It was full of it, if you'll pardon the expression.

JS: But it did get you in touch with the hydraulics. I mean, I remember when we were trying to decide how to sample with these divers, and we would practice on the McKenzie river, which is a pretty turbulent, fast moving stream. And they were down there, Hawkins and McCullough. And this guy was kind of fishing the bank, looking at them, and wanted to know what we were doing. And we were just kind of trying it out. And he says, "You guys are nuts." And he says, "You wouldn't catch me dead in there. And we starting talking to him and ask him what he did, and he rode whales down a thousand feet. And he was thinking that there was no way he'd get in a turbulent river with a lung and face mask, and all that on. And so it kind of gave a different perspective. But the perspective to me with you looking at these fast-moving bugs all kind of magnified was going in and going into a pool in the lower Salmon and looking up, and there are standing waves above you, and you're just in still water. And so I never really realized, I mean you'd read about it, but you'd never really felt it or experienced it, and it was just sensational.

20:10

WM: Yeah, that really—what you observed and others report on gave us some insights in trying to interpret the eighth-order data, in terms of what we were seeing and the whole overriding dynamic of the transport, as opposed to the non-transport parts of the system.

20:30

KC: And that was deep water, too.

JS: And you'd follow the sponges from green to white.

KC: You know we had a bottom-sampler. The thing with the glove box with a big pump in there, and so.

JS: Now who was that—who was that Bob Gayle, or uh . . .

WM: That's who invented it.

JS: Yeah, and we went up. I think, was it you and I went up and looked at it the first time?

KC: Yeah, was it? Okay.

JS: We bought one of those to try out, and it never really panned out as well as we wanted, but—

KC: The guzzler was the thing I remembered. It was the main piece of equipment. We had a giant pump that you pumped a little water up. We could pump rocks that big through it. Put the tube down and pump the damn sand out into fifty-nine cents. And that was—

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JS: But I think that also at that time, because we were trying to figure out how to do things, there were tremendous advances in technology. And I look at the chambers as one that just—really, nobody was really doing much. They were dinking around with that. But the collective of Bottt and Brock and Gregory And using stuff that McIntire had done and modified there. I mean, it moved at a whole long way fast to get at a specific question. And so . . .

22:07

RV: Yeah, real method development.

WM: So at a much simpler level, the considerations about the transport and the BOM and the fractionation of it, and I think that some of that came from your earlier work on the detritus break-down some, but still, nobody had really attempted to characterize classes of the FBOM and CBOM and the BOMs

KC: Yeah, that's right.

22:40

BC: Which we actually carried on through our next proposal with the C-14 stuff. We'd predicted this from the continuum. Didn't quite hold. We had to figure out how to go on to the next step and see how far the stuff really went. It spun off that next proposal.

22:56

KC: So with Stroud and the Kellog we were running these thousands of these Gilson respirometers. I had a full-time person, and all she did was run those. You know, there were two machines she'd set up every morning, and get in two runs, and oil the things overnight, and do it again and—

RV: Maybe all that wasn't so necessary.

KC: Yeah, exactly. You know, we did a lot of that to try to figure out—

RV: Energy budgets.

KC: Exactly.

23:23

WM: One place where we would have gone or didn't go that I wonder about is the whole DOC aspect. And it may be that we were just limited by the technology of the time. I think that Rick Larson Had some really exciting things with the disappearance of the really non-recalcitrant materials early-on, how quickly they went, and how far the recalcitrant materials went. So we

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weren't really able to look aspeciate, look at that in a lot of detail without some really elaborate chemical—

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KC: Was Cliff Dahm Involved at all in the—

JS: Cliff was an evident peripheral.

KC: But he certainly got some ideas. I mean, his whole thesis was on—

JS: Oh yeah. His thesis looked at DOC and some diurnal seasonal patterns in the flowstream but also from the Bonneville Dam to the mouth of the Columbia. So he was looking at DOC at the bottom end. I mean, he had Portland in there too, but essentially he was taking an oceanographer's view.

KC: But the lab experiments he ran, some of those came right out of continuum ideas. Where you get this initial physical take-up that takes place in minutes, and then you have this biological take-up that takes twenty-four or forty-eight or more hours.

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JS: And then we did a bunch of stuff that wasn't straight off the continuum, but it really followed up, looking at beaver ponds, and steppes below landslides, and you get this anoxic and you get this release of nitrate phosphorus. And there're hot spots where there'll be a lot of action, lot of nutrient turnover, a lot of algae.

25:09

WM: And a lot of this was set in the framework of the four back a rig, the interplay in the Salmon, that could be a fairly significant thing, and we just sort of weren't even aware of it. And have this sort of move back on it.

25:27

KC: Well there was Lienkempper, and whoever worked with him that mapped the wood And all the sites, right. So we had this idea that that was certainly a—and if you look at the inter-biome comparison, they've all got the maps with the wood debris. So the idea that wood debris was something to compare. And Lienkamper was the one that made all the pickup stick drawings.

25:51

VR: How about your studies on the Wilamette and things. Was that influenced by the continuum, on the wood removal, and the documenting—

JS: Well, that got into just history, and part of that—You know there's a lot of things that come full circle. And some of it came out of you couldn't miss the large wood in these coniferous streams. I mean, you'd be traipsing over six-foot diameter fir or cedar on your way to the site. And we didn't pick up on it early on, but we were on to it by the time the continuum came on. And then that nudge we got was from Liken's group, cause they were doing it. And then Bilby at the time came out with his thesis, looking at the role of wood in retaining materials in the Hubbard Brook. And so the thing was—this was just a west-coast phenomenon, these big coniferous forests. And I said, like hell. I mean, just theoretically, any time you have a forest influencing, something, they've got to fall in. So then I started looking through old records of the corps of engineers snag records. And I started working back from large streams to small streams. And then you got into splash drives. And you could find all these little—it didn't matter whether you were on the lower Colorado, on the Kissimee, I mean you had us do some stuff later on. But the story was all the same in terms of edge structural habitats, side channels, and things. And so we felt it was just a story that was the same. Europe lost it a couple centuries before we did. And we still had parts of it there in large rivers, but by and large, everyone else was missing that. And then that started to a whole different thing with microhabitats, and we moved it to salmon, and salmon habitats. But the historical stuff certainly was looking at that. And that was going back to Charles Lyle in the 1860's, and Marsh, and they'd talk about these big rafts of wood that come out of the great rivers of the world. And so since you were stringing it all back to the little streams and . . .

28:10

KC: Well it became clear that most of those streams had been snagged. I mean, they consciously for a century removed wood from streams. And the reason the west was different was they didn't get around to all of it yet. But they were working on it.

JS: Oh yeah, right. And in fact the stream, at the time, ninety percent of the money for stream improvement, well it was a channelization story in the south and in the Midwest and the east. It was a fish habitat. And from the early thirties, everyone felt that these big debris jams were an impediment for fish passage, and if you only got rid of them, the legend went in the 1890's and the fish wardens, that the fish would have more energy to get up and go back, and they wouldn't die. And it was just a thing. But the knot then came on fish passage or partial. So anyone that looked at that, it was a negative. And ninety percent of the stream improvement money was to blow up beaver dams and to pull wood out of streams. And so that was an impetus to look at it again too.

29:27

KC: I remember we went up a stream without Robin and one of those, and you pointed out that well you know, this is good. This is arguing for a long long time that all these streams were degraded forever. And now lot of this again lines being converted to other things, and streams just turning graded. And some of these old trees are coming back up. They've been buried down in the sediment forever. And like wormy chestnut. Worries about the millions of Square foot is coming back, getting exposed again. And so we started looking at Michigan for exactly that same thing, particularly since the Chestnut blight went around it. And white pine was just gone,

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but there's a lot of streams where there's actually White Pine that's down in there. That's down, once these streams start to degrade after this long period of sediment in, only sediment in for all kinds of reason.

30:21

RV: Yeah, a lot of trees are appearing again, White Cedar's another one that's reappearing.

KC: So I thought that was a really neat, interesting story.

RV: I think some of the interest in looking at this large wood that we could easily see, especially in the Andrews. How they were structuring the drop of the stream with their steps And retaining again. And we were also aware of Leopold's work on the uniformity of energy dissipation in the channel. Streams don't accelerate if they go down stream appreciably, but there is this trade-off in energy dissipation. Energy dissipation is very important in streams to prevent erosion. And stepping streams down progressively is an important way of dissipating energy. Pull sequences in honor, function, channel, Lisbon, design and flow And I think looking at how this energy that's stepped down is really important, and trees have always been a part of balancing the landscape to floodplains and slopes. And I think this evolved out of our studies. You get the linkage of streams in the landscape and the role of vegetation, and the controls, you know. It goes with a very important contribution of this project to the management of forests, especially in the pacific northwest. It was a Stiltzer-stienburg

32:20

WM: Yeah, you know it was a total paradigm shift, and you know from one of removing the wood as you start outsidings to one of protecting and encouraging.

JS: But it flipped around also to a recognition, where before we always talked about fish-bearing streams, as if they were separate, and now you had had fish where you didn't, as opposed to a network that was fed by a real intimate connection with the surrounding forest. Then that moved on up into northwest forest plan, where the acknowledgement of intermittent streams in feeding this, both for habitat, in the form of wood that would come in, but also in the form of fine particulates, or other partially-digested materials, or just refuges during high-flow of going in in those interstitualaries was huge in city-side repairing buffers.

VR: Well, I want to make sure we get back to this tomorrow, cause this is really an important point.